

mentioned), and passed eastward, its path being about three-fourths mile in width. This tornado was accompanied by hail of very large size, some of the hailstones measuring six inches in circumference.

Wilmington: a very heavy rain and thunder storm, accompanied by hail, occurred between 11.15 and 11.50 p. m. of the 25th. Hailstones measuring one inch in diameter were picked up after the storm. From two to three miles south of the city windows were broken, gardens ruined, and small animals killed by the hailstones.

Charlotte: a severe storm passed over this city between 9 and 10 p. m. of the 25th. It passed in an easterly direction and was accompanied by a remarkable electrical display. Very little damage was done in this city, but at points a few miles southwestward, dwellings and trees were blown down. Reports from Newton, Catawba county, state that about thirty houses were blown down during the storm on the night of the 25-26th, and that many persons were injured. The storm is also reported to have been very severe in Iredell county, where great damage was done to buildings and forests. But little damage was done at Charlotte.

Ohio.—Dayton, Montgomery county: the storm of the 25th, was very destructive in this vicinity. It passed in a north-easterly direction, leveling trees and buildings in its course. The path of the storm (about fifty yards in width), was not continuous, the forests showing that in places the storm lifted from the earth. Five buildings were wrecked in this city. At Shakertown, seven miles distant, several houses were blown down, and thirty houses were reported to have been destroyed at Ridgeville.

Ripley, Brown county: many buildings were unroofed by the storm on the evening of the 25th.

Youngstown, Mahoning county: several residences in Poland township, in this county, were demolished by the storm of the 25th. The path of the storm was about ten rods wide and two miles in length.

South Carolina.—Seneca, Oconee county: at 5 p. m., of the 25th, a tornado passed ten miles southeast of this place, destroying much property and causing loss of life. The storm passed within two miles of Pendleton, Anderson county, where buildings were destroyed and several persons injured.

Mr. Jackson Counts, postmaster at Peak, Lexington county, reports that one of the most destructive wind and hailstorms ever experienced in that vicinity occurred between 5 and 6 p. m. of the 25th. People and stock were injured by the falling hailstones, which were unusually large and of a variety of shapes. Several houses were unroofed, and trees and fencing were blown down.

Alston, Fairfield county: a storm passed near this place on the afternoon of the 25th, passing in an easterly direction. Dwellings, out-buildings, and trees were blown down, and at some places the storm was accompanied by hail of large size, which destroyed window-glass and injured the roofs of buildings. At Chester, Chester county, buildings were blown down.

Greenville, Greenville county: on the afternoon of the 25th a severe and destructive storm passed over Anderson and Greenville counties, destroying dwellings and causing other damage. Nearly all of the dwellings at Simpsonville, Greenville county, were blown down, and two persons were killed. During the night of the 25-26th a severe hail storm occurred, causing considerable damage to small grain.

Tennessee.—Chattanooga: on the evening of the 8th a tornado occurred at Whiteside, Marion county, where considerable damage was done. A dwelling was blown down, and one of the inmates killed. Several buildings in that vicinity were partly destroyed. A thunder-storm occurred on the afternoon of the 25th, which was accompanied by a slight fall of hail. No damage resulted in this immediate vicinity, but very destructive hail storms occurred at various points in the state.

Morristown, Hamblen county: on the afternoon of the 25th a tornado, accompanied by hail and heavy rain, visited this

county. Buildings were unroofed, trees uprooted and telegraph lines prostrated.

Nashville: this city and the northern part of Davidson county were visited by a destructive rain and hail-storm on the 25th, which caused a large amount of damage. Between 7 and 8 p. m. a tornado occurred about six miles from this city near the line of the Louisville and Nashville railroad, destroying barns and other buildings and uprooting trees.

Texas.—Fort Elliott: a severe southerly storm occurred on the 10th, the wind reaching a velocity of sixty miles per hour at 4 p.m. Telegraph lines were prostrated and at Mobeetie, a few miles southeast, a building was wrecked. On the 27th, a storm occurred during which a wind velocity of sixty-eight miles from southwest was registered.

El Paso: a severe westerly storm occurred on the 10th which caused considerable damage to roofs, signs, etc.

NAVIGATION.

In the following table are shown the danger points at the various river stations; the highest and lowest stages for March, 1884, with the dates of occurrence; and the monthly ranges:

Heights of rivers above low-water mark, March, 1884.

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Date.	Height.	Date.	Height.	
<i>Red River:</i>						
Shreveport, Louisiana.....	29 9	1	31 11	31	18 0	13 11
<i>Arkansas:</i>						
Little Rock, Arkansas.....	33 0	1	12 0	24	7 5	4 7
Fort Smith, Arkansas.....		1	1 0	23	—1 10‡	2 10
<i>Missouri:</i>						
Yankton, Dakota †.....	20 0	22	16 0	30	15 2	2 10
Omaha, Nebraska †.....	16 0	24	15 0	20, 21	7 0	8 6
Leavenworth, Kansas.....	21 0	25	10 2	2, 3, 6, 7	5 0	10 8
<i>Mississippi:</i>						
Saint Paul, Minnesota †.....	14 6	31	9 2	24	4 0	5 2
La Crosse, Wisconsin †.....	18 0	29	9 0	27	7 0	2 0
Dubuque, Iowa †.....	21 10	26	12 9	27	11 5	1 4
Davenport, Iowa †.....	15 0	28, 29	11 11	24	9 1	2 10
Keokuk, Iowa †.....	14 0	30, 31	16 8	20	7 9	8 11
Saint Louis, Missouri.....	30 0	28	25 7	10, 11	9 5	16 2
Cairo, Illinois.....	40 0	1	49 7	11	36 2	13 5
Memphis, Tennessee.....	34 0	1, 2, 3	35 1	16, 17	31 3	3 10
Vicksburg, Mississippi.....	41 0	23	49 0	1	45 0	4 0
New Orleans, Louisiana *.....	—2 6	18, 19, 24	† 0 1	1, 2, 4	—1 5	1 6
<i>Ohio:</i>						
Pittsburg, Pennsylvania.....	20 0	13	18 11	7	3 9	15 2
Cincinnati, Ohio.....	50 0	17	49 8	7	17 11	31 9
Louisville, Kentucky.....	24 0	14	25 10	6, 7	8 6	17 4
<i>Cumberland:</i>						
Nashville, Tennessee.....	42 0	15	49 3	4	13 9	35 6
<i>Tennessee:</i>						
Chattanooga, Tennessee.....	33 0	11	43 0	5	7 11	35 1
Knoxville, Tennessee.....		7	22 4	4	2 4	20 0
<i>Monongahela:</i>						
Pittsburg, Pennsylvania.....	29 0	13	18 11	7	3 9	15 2
<i>Savannah:</i>						
Augusta, Georgia.....	21	26 4		5	7 3	19 1
<i>Willamette:</i>						
Portland, Oregon.....		1	7 1	21	3 5	3 8
<i>Sacramento:</i>						
Red Bluff, California.....		10	15 0	2	2 10	12 2
Sacramento, California.....		15	22 0	3, 4	14 0	8 6
<i>Mobile:</i>						
Mobile, Alabama.....		18	17 4	10	14 0	3 4
<i>Colorado:</i>						
Yuma, Arizona.....		11	27 2	27	17 0	10 2

* Below high-water mark of 1874 and 1883. † Frozen part of month; see text. ‡ Below bench-mark. § No record from 13th to 20th.

STAGE OF WATER IN RIVERS.

The upper Mississippi river at Saint Paul, Minnesota, was frozen from the 1st to 23d; at La Crosse, Wisconsin, from the 1st to 21st; at Dubuque, Iowa, from the 1st to 24th; at Davenport, Iowa, from the 1st to 23d; and at Keokuk, Iowa, from the 1st to 14th. At Saint Louis, Missouri, it was lowest on the 10th and 11th and highest on the 28th. At stations from Cairo, Illinois, to New Orleans, Louisiana, the daily stages of water are given in the table under "Floods," on page 80.

The Missouri river at Yankton, Dakota, was frozen from the 1st to 20th; and at Omaha, Nebraska, from the 1st to 18th. At Leavenworth, Kansas, it was lowest on the 2d, 3d, 6th, and 7th, and highest on the 25th.

The Ohio river was lowest on the 6th and 7th, and highest from the 13th to 17th. At Cincinnati it rose to within four

inches of the danger-line on the 17th. At Louisville the river rose to the danger-line on the 13th, and reached its highest stage on the 14th, when it was twenty-two inches above the danger-line.

The Red river at Shreveport, Louisiana, was at its highest stage on the 1st, when it was twenty-six inches above the danger-line.

The Cumberland river, at Chattanooga, Tennessee, reached the unusual height of forty-three feet on the 11th, at which time it was ten feet above the danger-line.

ICE IN RIVERS AND HARBORS.

New Haven harbor.—New Haven, Connecticut: ice in harbor broke up and passed out into Long Island sound on the morning of the 7th. Navigation on the Connecticut river was resumed on the 15th.

Hudson river.—Albany, New York: floating ice on the 19th and 20th. Navigation resumed on the 26th.

Menand Station (near Albany, New York): ice began to move on the 17th; river clear of ice on the 21st; first boat of the season arrived at Albany on the 28th.

Poughkeepsie, New York: the steamer "Norwich," with boats in tow, passed this place, bound southward, on the afternoon of the 22d, being the first tow of the season. On this date all ice north of Poughkeepsie was moving downward except that between Hudson and Stockport.

Shrewsbury river.—Red Bank, New Jersey: the ice in the river at this place broke up and passed out into the bay on the 19th, causing but little damage, and leaving the river open to navigation.

Lake Ontario.—Rochester, New York: the lake was covered with floating ice on the 1st and 2d.

Lake Erie.—Cleveland, Ohio: the sloop "Pacific," from Marblehead, Ohio, arrived on the 27th, being the first boat of the season.

Buffalo, New York: the ice in the lake was broken up by the storm of the 12th.

Toledo, Ohio: navigation was resumed on the west end of the lake on the 30th, the first steamer of the season departing on that date.

Sandusky bay.—Sandusky, Ohio: the bay was clear of ice on the 18th; on that date the steamer "American Eagle" reported that Lake Erie was clear between Buffalo and Kelley's island, but north of that island there were large quantities of ice. Sandusky harbor was covered with slush-ice on the 19th.

Niagara river.—Buffalo, New York: floating ice on the 13th, 25th, 26th, 30th and 31st.

Oswego river.—Oswego, New York: floating ice on the 17th: harbor clear of ice on the 20th.

Detroit river.—Detroit, Michigan: all ice, except that along the shores, moved out of the river on the 3d; floating ice on the 16th, 17th, 19th, 20th, 21st, 22d, and 25th to 29th; the docks were clear of ice on the 24th.

Maumee river.—Toledo, Ohio: ice began to break up on the 16th, and on the 18th, it moved out without causing damage.

Grand river.—Lansing, Michigan: ice began to break up on the 19th; river clear of ice on the 21st.

Black river.—Port Huron, Michigan: ice went out of the river on the 22d, and navigation for the season was resumed on that date.

Straits of Mackinac.—Mackinaw City, Michigan: the steamer "Algomah" arrived at Saint Ignace on the 6th, having been frozen in the straits since January 28th. On the 27th, the ice in the straits was sufficiently strong to permit the crossing of teams.

Lake Michigan.—The Signal Service observer at Milwaukee, Wisconsin, reports the following: "lake navigators state that the ice in the lake during March was without precedent. During the first part of the month it was estimated that there were not ten miles of clear water between this port and the opposite shore of the lake, a distance of eighty-five miles. The ice varied in thickness from four to twelve inches, with numer-

ous bergs projecting twenty feet above the water. The propellers "Wisconsin" and "Michigan," of the Grand Haven and Milwaukee line, were ice-bound in Grand Haven harbor from February 22d to March 10th. The westerly gales blew the ice eastward, blocking the harbors on the eastern shore."

Chicago, Illinois: on the 18th the ice in the harbor was sufficiently strong to bear the weight of vehicles. On the 22d the schooner "C. North" arrived from Michigan City, Indiana, being the first boat of the season. The propellers "De Pere," from Manitowoc, and "Monitor," from Michigan City, arrived on the 24th; on that date navigation for the season was fully opened.

Grand Haven, Michigan: the harbor entrance was blocked with ice on the 3d; on the 4th Grand river froze over. The propellers "Michigan" and "Wisconsin" departed for Milwaukee on the 10th. The steam-barge "J. B. Heath" from Saugatuck, Michigan, arrived on the 27th.

Manistique, Schoolcraft county, Michigan: the lake opened on the 23d; Manistique bay clear of ice on the 26th.

Mississippi river.—Saint Paul, Minnesota: the ice began to soften on the 24th. On the 26th, the ice-dam moved out of the harbor and lodged a short distance below; on the 29th, the river became clear of ice.

Hastings, Minnesota: the river opened opposite this place on the 28th.

La Crosse, Wisconsin: the ice broke up at 11.25 a. m. of the 26th and at 1 p. m. of that date the river was clear of ice. Navigation was resumed on the 29th.

Dubuque, Iowa: the ice began to weaken on the 18th; on the 21st the ice was covered with water, and the crossing by teams was abandoned. The ice broke up on the 24th, causing slight damage and forming a dam on the islands below the city. The river was clear of ice on the 30th.

Fort Madison, Iowa: ice broke up on the 15th and 16th; the first boat of the season arrived on the 24th.

Muscatine, Iowa: the ice in the Mississippi broke up during the afternoon of the 24th.

Rock Island, Illinois: the river which had been closed since December 20th, opened on the afternoon of the 22d.

Burlington, Iowa: the ice broke up on the 17th; the first steamer of the season arrived on the 25th.

Davenport, Iowa: ice broke up on the 23d and formed an ice-dam at the foot of Main street. At the islands below the bridge, large blocks of ice were piled up to a height of from forty to fifty feet. During the afternoon the ice-dam gave way and the ice passed out without causing damage. The first steamer of the season arrived on the 24th. Floating ice on the 25th, 26th, and 27th.

Keokuk, Iowa: the ice moved slightly on the 14th; on the 15th, an ice-dam formed below the city; floating ice from 20th to the 23d. First steamer of the season arrived on the 24th.

Saint Louis, Missouri: floating ice on the 2d, 3d, 5th, 6th, and 9th.

Ohio river.—Pittsburg, Pennsylvania: floating ice from the 1st to the 6th, 8th, 9th, and 13th.

Missouri river.—Fort Buford, Dakota: the ice broke up on the 24th; on the 24th an ice-dam formed five miles below this place. The ice-dam broke on the 26th; floating ice on the 27th, 28th, and 30th.

Bismarck, Dakota: the ice broke on the 26th and formed an ice-dam at Sibley island, causing the water to rise about four feet. The steamers "Beahan" and "Black Hill" were crushed by the ice and sunk on the 27th and 28th, respectively. The ice-dam caused an overflow on the 29th.

Fort Yates, Dakota: the ice broke up on the 27th.

Fort Bennett, Dakota: the ice in the river broke up on the 31st.

Yankton, Dakota: an ice-dam formed in the river on the 21st.

Omaha, Nebraska: the new railroad bridge across the Missouri near Blair was badly damaged by an ice-dam on the 22d.

Vermillion, Dakota: the ice began to break up on the 18th; on the 25th the river was free of ice.

Nebraska City, Nebraska: the ice broke up and passed out of the river on the 15th.

Maquoketa river.—Monticello, Iowa: the ice went out of the river on the 21st.

Manchester, Iowa: the ice broke up and passed out of the river on the 22d.

Des Moines river.—Des Moines, Iowa: the ice broke up on the 19th; floating ice on the 20th and 21st; river clear of ice on the 22d.

Humboldt, Iowa: the ice went out of the river on the 22d.

Ottumwa, Iowa: the ice broke up on the 14th.

Kansas river.—Salina, Salina county, Kansas: the ice went out of the river on the 13th.

Platte river.—Clear creek, Saunders county, Nebraska: the ice began to break up on the 18th, forming an ice-dam on the 19th; on the 24th the ice-dam gave way, carrying away a part of the railroad bridge. The river was free of ice on the 25th.

Dakota river.—Morriston, Dakota: the ice broke up on the 16th.

Arkansas river.—Sherlock, Finney county, Kansas: the ice broke up on the 9th.

Miscellaneous.—Little Egg Harbor, New Jersey: much ice in the sound from the 1st to the 5th, and on the 7th.

Chicago, Illinois; on the 19th, ice in the Des Plaines river was nineteen inches thick.

FLOODS.

In the following table are shown the daily stages of water as observed at the Signal Service stations on the lower Mississippi river during March 1884:

Station	Cairo.	Memphis.	Vicksburg.	New Orleans
	ft. in.	ft. in.	ft. in.	ft. in.
Danger-point.....	40 0	34 0	41 0	*-2 6
March 1.....	49 4	35 1	45 0	-1 5
2.....	48 5	35 1	45 1	-1 5
3.....	47 6	35 1	45 2	-1 4
4.....	46 3	35 0	45 3	-1 5
5.....	44 10	34 11	45 4	-1 4
6.....	43 2	34 11	45 5	-1 3
7.....	41 2	34 9	45 6	-1 1
8.....	39 5	34 8	45 8	-0 8
9.....	37 10	34 5	45 9	-0 8
10.....	36 7	34 1	45 9	-0 8
11.....	36 2	33 7	45 9	-0 7
12.....	36 7	32 11	45 11	-0 6
13.....	37 7	32 2	45 11	0 0
14.....	38 11	31 8	46 0	0 0
15.....	40 2	31 4	46 0	0 1
16.....	41 3	31 3	46 0	0 3
17.....	42 4	31 3	46 1	0 5
18.....	43 3	31 5	46 7	+0 1
19.....	44 2	31 9	47 4	0 1
20.....	45 0	31 11	48 1	0 3
21.....	46 1	32 2	48 6	0 1
22.....	46 9	32 4	48 10	0 1
23.....	47 2	32 6	48 10	0 0
24.....	47 5	32 9	48 11	+0 1
25.....	47 7	33 1	48 11	0 1
26.....	47 8	33 3	48 10	0 0
27.....	47 10	33 6	48 8	0 3
28.....	48 1	33 8	48 6	0 3
29.....	48 5	33 9	48 4	0 3
30.....	48 7	33 9	48 2	0 3
31.....	48 3	33 10	47 11	0 5

* Below high water mark of 1874 and 1883.

At the beginning of the month the lower Mississippi river was above the danger-line from Cairo, Illinois, southward. At Cairo, the river fell from forty-nine feet, four inches, on the 1st, to thirty-six feet, two inches, on the 11th, and afterwards it rose until the close of the month, at which time it was forty-eight feet, three inches above low water mark.

At Memphis, Tennessee, the river was stationary on the 1st, 2d and 3d, at thirty-five feet, one inch, or thirteen inches above the danger line. It began to fall on the 4th; reached its lowest stage on the 16th and 17th, and afterwards rose steadily until the end of the month when it was within two inches of the danger-line.

At Vicksburg, Mississippi, the river rose uninterruptedly from the 1st to 24th, reaching a point seven feet, eleven inches, above the danger-line on the latter date; it remained sta-

tionary during the 24th and 25th, and afterwards fell slowly until the close of the month, at which time it was forty-seven feet and eleven inches above low-water, or nearly seven feet above the danger-line.

At New Orleans, Louisiana, the month opened with the river at seventeen inches below the highest point reached by the floods of 1874 and 1883. The river was at its highest stage on the 18th, 19th and 24th, when it was one inch above the flood-mark above mentioned. At the close of the month the water had fallen six inches below the highest point reached and was declining slowly.

During the flood of 1883 the water in the Mississippi river in the vicinity of Vicksburg and at points southward did not reach its greatest height during the month of March. In that year, at Vicksburg, the greatest height, forty-three feet ten inches, occurred April 6th; and at New Orleans the high-water mark of 1874 was attained on April 7th and 9th.

In the following table are given the highest stages of March in 1883 and 1884, at Memphis, Vicksburg, and New Orleans:

Mississippi River.

Station.	Memphis.				Vicksburg.				New Orleans.			
	Highest.		Lowest.		Highest.		Lowest.		Highest.		Lowest.	
	Date.	Height.	Date.	Height.	Date.	Height.	Date.	Height.	Date.	Height.	Date.	Height.
March, 1883 ...	5 to 8	35 8	30	19 2	31	43 5	1	42 3	31	0 10	1	2 11
March, 1884 ...	1,2,3	35 1	16,17	31 3	23	49 0	1	45 0	18,19,24	0 1	1,2,4	1 5
Danger-line ...	34 feet.				41 feet.				* -2 feet 6 inches.			

* Below high-water mark of 1874 and 1883.

The following reports relate to the flood of March, 1884, in the lower Mississippi river:

Cairo, Illinois, 31st: the bottom lands in this vicinity continued under water during March. From the 21st until the end of the month, all railroad tracks, leading out of this city, were submerged, with the exception of the Illinois Central. On the 22d, all of the landings on the Kentucky shore of the Ohio river, between Cairo and Paducah, were under water, the lower part of the latter place being inundated to a depth of seven feet.

Memphis, Tennessee: trains on the Memphis and Little Rock railroad, between this city and Madison, Arkansas, were discontinued on the 31st, on account of the overflowed condition of the tracks. Reports from Arkansas City, Arkansas, on the 10th, stated that that place was inundated, and that several warehouses had been washed away. Reports from Trother's landing, Tunica county, Mississippi, on the 10th, stated that the break at that place was about two miles in width, with an average depth of five feet.

Helena, Arkansas: on the 3d the river was within one inch of the high water mark of 1883. On that date many of the inhabitants of the Saint Francis river bottoms moved into the high lands of Lee county. The overflow in Tunica and Coahoma counties, Mississippi, equalled the overflow of last year. On the 4th, the plantations on the Arkansas side of the river, from Arkansas City to Helena, were almost without exception submerged. Reports from Oldtown, on the 5th, stated that the water was rushing through the crevasse at that place with great force, overflowing the country bordering on White river. The river on the 6th was one inch above high water of 1883. On that date the whole country between Lawrenceville and Indian Bay in Monroe county, was under water. The levee protecting a large part of Oldtown, twenty miles below Helena, broke on the 7th, making a crevasse four hundred yards in width. The water swept over the adjacent lowlands carrying away nearly every movable object. On the 20th, reports from Coahoma county, Mississippi, twelve miles below Helena, Arkan-

sas, showed that the river had fallen about three feet below the highest point reached at that place.

Greenville, Washington county, Mississippi: the Mississippi river had declined fourteen inches on the 20th, and the back water on the plantations on the east side of Deer creek began to recede.

Vicksburg, Mississippi: at Lake Providence, in East Carroll parish, Louisiana, a small levee broke on the 6th, flooding a part of the town. A serious break occurred in the Raleigh levee in the lower part of East Carroll parish on the morning of the 9th. On the same date, Klinton, a small village near Vicksburg, was inundated. Reports from Sharkey, Tallahatchie county, Mississippi, stated that on the 12th the water in the Tallahatchie river was within six inches of the high water mark of 1882. On that date, from Sharkey to Greenwood, Le Flore county, a distance of one hundred miles, many of the plantations on both sides of the river were overflowed and the town of Greenwood was almost entirely inundated. Captain Smith, of the steamer "E. C. Carroll," from Sharkey, reported that the condition of this region was much better than during the flood of 1882, and that the planters were of the opinion that the water would recede in time to enable them to pitch their crops. Reports from Satartia, Yazoo county, Mississippi, on 19th, stated that that town was three feet under water. The town of Delta, Louisiana, was overflowed on the 20th. Reports from points westward of that place, on the Vicksburg, Shreveport and Pacific railroad, stated that the road was inundated to a considerable depth between Delta and Tallulah. At California station the road bed was covered to a depth of forty-two inches. At Eagle Bend, Warren county, Mississippi, on the 21st, the water covered everything except a few knolls. Hardtimes and Fairview levees broke on that date, the latter being located about twenty miles below Natchez on the eastern side of the river. On the 22d, the water covered Levee street in many places, flooding the first floors in a number of business houses. The river gauge at noon read one inch higher than the highest stage of 1882. The steamers "R. R. Springer" and "C. D. Shaw" brought a large number of refugees to this city. On the 31st, the river was receding at the rate of three inches per day. On that date, the crevasse at Raleigh landing was four hundred yards in width and about fifteen feet deep. A break in the Alsatia levee was reported to have occurred during the night of the 30th-31st.

Saint Joseph, Tensas parish, Louisiana: the Buck Ridge and Shipp's levees broke at 8 p. m. of the 20th. Point Pleasant and Hewett gaps also broke, causing an overflow in Tensas parish and in the parishes lying southward.

Rodney, Jefferson county, Mississippi: the Kemp levee broke on the night of the 24-25th. On the 25th an appeal was made to the national Congress for aid. On that date it was reported that Tensas parish was entirely submerged and that 20,000 people were destitute.

Natchez, Adams county, Mississippi: on the 15th the river was fifteen inches above high water of 1883. The back-water in Concordia parish, Louisiana, compelled some of the planters to remove stock to high grounds, and many plantations along Black river were overflowed.

Bayou Sara, Louisiana: the Protection levee at Waterloo gave way during the night of the 24th, resulting in the overflow of many of the small farms on False river.

Monroe, Ouachita parish, Louisiana: reports from this place on the 10th, stated that, with the exception of the court-house and a few other buildings, the entire town of Bayville, Richland parish, was under water. A continuous sheet of water extended from Bayville to the Mason hills. From Waverly to Tallulah, in Madison parish, the country was covered with water. Two-thirds of the Vicksburg, Shreveport and Pacific railroad from Delta, Madison parish, to Monroe, were inundated, all of the land in Madison parish south of the railroad being under water.

New Orleans, Louisiana: a crevasse, thirty feet wide, occurred on the 7th in the levee at Live Oak, about two miles

above Thibodeaux, La Fourche parish. On the same date a crevasse occurred in a levee three miles below Algiers, which was reported to have been fifty feet wide and five feet deep. A break occurred at 5 a. m. of the 8th in the levee at Davis' plantation, Saint Charles parish, about nineteen miles above this city. The crevasse was reported to have been thirty-five feet wide and six feet deep. The tracks of the Texas Pacific railway were submerged and displaced. The Morganzia levee, in Pointe Coupee parish, one of the most important embankments in the state, was swept away on the evening of the 14th. This levee protected a large sugar producing district; it was over a mile in length, and was recently constructed at a cost of \$75,000. On this date the river reached the high-water mark of 1874 and 1883. On the 21st there were ten crevasses on the west side of the Mississippi river between New Orleans and Vicksburg, the Morganzia crevasse being nearly a mile wide, with an average depth of ten feet. On that date, twelve parishes, embracing the most productive sections of the state, were more or less inundated. On the night of the 25-26th a break occurred in the levee at the Guidry plantation, in Saint James parish, causing the inundation of a large area of cultivated land. In nineteen miles of levee around Lake Concordia, Concordia parish, there were thirteen crevasses, aggregating many thousand feet. The people along the watercourses abandoned their homes and drove their stock to places of safety. At 10 a. m. of the 29th the upper portion of the old Racourci levee, in Pointe Coupee parish, gave way, and every effort to stop it was without effect. On the 30th the break was over one hundred feet in width and eight feet deep. On that date the water from the Davis crevasse, in Saint Charles parish, on the west bank of the river, which broke March 8th, covered the neighboring plantations and inundated the Texas Pacific and the Louisiana and Texas railroads for a distance of several miles. On the 30th the Davis crevasse was seven hundred feet wide and from thirty to forty feet deep. The Mississippi river at this point fell slightly on the 31st, but the water in the Atchafalaya river continued to rise.

The following reports of floods, occurring in the smaller rivers and streams in the several states and territories during March, have been received.

Alabama.—Montgomery: the Alabama river was much swollen on the 13th. The river rose two feet during the six hours ending at 6 p. m., and overflowed its northern banks opposite this city. It continued to rise on the 14th and 15th, and began to fall on the 17th.

Mobile: serious washouts occurred on the Louisville and Nashville railroad on the 26th, owing to heavy rains.

Arizona.—Tucson: reports from Florence stated that a "cloud burst" occurred there on the morning of the 7th, flooding the streets to a depth of four feet and causing damaged estimated at \$10,000.

Yuma: several miles of the Southern Pacific railroad track, east of Yuma, were reported to have been washed away on the 10th. During the night of the 11th, the Gila river broke through the levee and flooded the town; many families were compelled to vacate their homes, and numerous buildings were undermined. The river began to fall on the evening of the 12th. On the 15th, a large part of the town was still under water. The damage sustained by the citizens of Yuma is estimated at more than \$250,000.

California.—Niles, Alameda county: the heaviest rain storm of the season occurred on the 8th and 9th. The Alameda creek below this place overflowed and flooded the adjacent lowlands.

Livermore, Alameda county: the heaviest fall of rain ever known here occurred on the 8th and 9th, causing the creeks to overflow. The country between Livermore and Pleasanton was submerged, and several bridges were undermined. A small landslide occurred on the railroad near Niles, causing delay of trains.

Pleasanton, Alameda county: the heavy rains preceding the 9th, caused all streams in this locality to rise to unusual heights. Many small bridges were swept away.

Lathrop, San Joaquin county: all land west of the San Joaquin river within one-half mile of the river bank was under water on the 14th.

Stockton, San Joaquin county: the Calaveras overflowed on the 9th and inundated the plains northeast of this city, causing considerable damage to crops. A washout occurred on the narrow gauge railroad, one and one-half miles west of Wallace.

San José, Santa Clara county: the heaviest rain of the season fell during the night of the 8-9th. The Guadalupe and Los Gatos creeks overflowed their banks, both above and below this place, submerging a large area of farming land. Trains on the Southern Pacific railroad were delayed for several hours on account of washouts.

Los Angeles: the heavy rains preceding the 8th caused greater damage to the Southern Pacific railroad than the storm of February. The railroad bridge across the Santa Anna river at Colton was washed away. Great damage was also done to the Southern Pacific railroad, north of Los Angeles. The river rose rapidly during the evening of the 9th, overflowing its banks in several places, and causing damage to the extent of several thousand dollars. Numerous buildings were washed away.

San Francisco: on the 10th the Colorado division of the Southern Pacific railroad was badly washed, west of Daggett, for a distance of six miles. The breaking of a levee at Robert's Island, near Stockton, San Joaquin county, on the night of the 18-19th, destroyed about 27,000 acres of growing wheat, entailing a loss of \$500,000.

Connecticut.—New Haven: on the 26th a massive dam at Beaver lake, eleven miles northwest of this city, gave way, resulting in the destruction of three large manufacturing establishments. The losses sustained are estimated at \$100,000.

Hartford: a high stage of water occurred in the Connecticut river on the 28th, flooding many cellars in the city and overflowing the meadows adjacent to the river.

Dakota.—Bismarck: the lowlands on both sides of the river were flooded on the 28th.

Illinois.—Rockford, Winnebago county: a portion of a mill at New Milford was swept away by high water on the 19th.

Iowa.—Cedar Rapids, Linn county: on the 26th the Cedar river reached the highest point known since 1858. Considerable damage was caused by the flooding of cellars, &c.

Louisiana.—Shreveport, 4th: on many of the plantations which were recently overflowed, ploughing and other farm work was begun.

Maine.—Bangor: the bridge near Hampden, Penobscot county, was swept away during the night of the 28th-29th.

Massachusetts.—Worcester, Worcester county: a new reservoir dam at Spencer, in this county, constructed at a cost of \$10,000, gave way on the 27th.

Lawrence, Essex county: the high-water in the Merrimac river, on the 28th, flooded the cellars in this city and caused suspension of work in the mills.

Michigan.—Port Huron: a freshet occurred in Black river on the 23d. Several boats and rafts of logs were broken from their moorings, and the bridge at this place was carried away.

Mississippi.—Yazoo City: on the 16th, all the lowlands in this vicinity were inundated.

New Hampshire.—Manchester, Hillsborough county: on the 28th the Merrimac river was higher than it had been since October, 1869.

Nashua, Hillsborough county: on the 28th, both the Merrimac and Nashua rivers were higher than they have been for the last four years. The backwater from the Nashua river overflowed cellars and lowlands.

Concord, Merrimac county: the Merrimac river was higher on the 28th than has been known for many years. The low lands in this vicinity were completely inundated.

Henniker, Merrimac county: the water in the Contoocook river was higher on the 28th than it has been for several years.

New York.—Utica: the water in Oriskany creek rose rapidly on the 12th, flooding the village of Oriskany and sweeping away outbuildings and fences. Cellars were filled to overflowing, and in many cases the water covered the lower floors of the houses. On the same day the Mohawk river overflowed, covering the New York Central railroad track to a depth of from two to three feet and causing delay of trains. By midnight of the 12-13th the water had subsided sufficiently to permit trains to pass over the road.

Buffalo: the heavy precipitation accompanying the storm of the 12th flooded the southeastern part of the city, the water reaching a greater height than has been known for ten years.

Pennsylvania.—Pittsburg: the Alleghany river reached a height of nineteen feet ten inches on the 13th, submerging the tracks of the Pittsburg and Western railroad between Sharpsburg and Alleghany City.

Rhode Island.—Providence: the dam of the Newport waterworks broke during the night of the 25-26th.

Tennessee.—Chattanooga: at 11.30 p. m. of the 7th, the river gauge showed a rise of thirteen feet and eleven inches during the preceding twenty-four hours, and on the 8th it reached the danger line. On the 9th the lower portions of the city were flooded. The river continued to rise on the 10th and 11th, reaching its maximum height, forty-three feet, on the latter date. This stage of water has been exceeded but twice in former years, viz.: fifty-eight feet, March 11th, 1867, and fifty-three feet, eleven inches, March 1st, 1875. Owing to the timely warning of the approaching flood, the damage was comparatively small.

Nashville: the Cumberland river, on the 14th, was several inches higher than at any time during the winter, and many families in the low lands were driven from their homes. Numerous small dwellings in the northern part of the city were inundated. Nearly all of the mills along the river were compelled to suspend operations on account of the high stage of water.

Utah.—Salt Lake City: at North Fork the Central Pacific trains were delayed for two days previous to the 7th, owing to an overflow of the Humboldt river. The water in Bear river was higher than has been known since 1873. The river rose seven feet in twenty-four hours, washing out all the bridges. Two bridges on the Waldo river were also washed away.

Virginia.—Petersburg: the heavy rain on the night of the 25-26th caused the water in the Appomattox river to reach a very high stage. The meadows adjacent to the river were flooded.

Lynchburg, 26th: the recent heavy rains in this part of the state caused an overflow in the James river. A portion of the Richmond and Alleghany railroad track was submerged, and several mill-dams were damaged.

Richmond: owing to the high stage of water in the James river on the 27th, navigation was temporarily suspended. All of the wharves in the lower part of the city were submerged.

HIGH TIDES.

New River Inlet, North Carolina: 26th, 27th.
Hatteras, North Carolina: 30th.
Cedar Keys, Florida: 12th.
Indianola, Texas: 24th.

LOW TIDES.

New River Inlet, North Carolina: 3d, 8th, 9th, 17th, 18th, 20th.

TEMPERATURE OF WATER.

The temperature of water as observed in rivers and harbors during March, 1884, with the average depth at which the observations were made and the mean temperature of the air at the various stations, are given in the table below. The highest water temperature of the month, 82° 2, was reported from Key West, Florida; the lowest, 27° 1, from Delaware Breakwater, Delaware. The following are the largest monthly ranges: 27° 0 at Delaware Breakwater; 25° 7 at Cedar Keys, Florida; 21° 3 at Galveston, Texas; 21° at Augusta, Georgia, and Chinc-